THE RADICAL CURE OF FEMORAL HERNIA.*

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BETWEEN the years 1891 and 1906 I performed 117 operations for femoral hernia in 105 patients. In thirty-four of these operations the patients were children between the ages of two and fourteen years. Nine were males and eighteen females. In 3 operations the patients were under five years of age; in 15 operations the patients were from five to ten years of age; in 14 operations the patients were from ten to fourteen years of age.

Eighty-three operations were done upon adults, or patients between fourteen and seventy years of age. Of these patients twelve were males, sixty-five females.

It will be seen that in children the relative frequency of femoral hernia in males to females is one to two, while in adults it is about one to six.

The relative frequency of femoral hernia to inguinal hernia, as given by Macready (Statistics of the London Truss Ass'n) is one to 16.

At the Hospital for Ruptured and Crippled it is one to 17.

The fifteen thousand and twenty-eight cases of inguinal and femoral hernia operated upon for radical cure at various clinics and by various surgeons, collected by Pott,[1] show 933 operations for femoral and 14,092 operations for inguinal hernia, or a proportion of one femoral to fifteen inguinal.

My own operative statistic for the radical cure of hernia shows almost exactly the same percentage, namely, 117 femorals in a total of 1,678 cases, or one operation for femoral to fourteen for inguinal hernia.

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Previous statistics have almost uniformly given a slightly higher mortality in operations for femoral than for inguinal hernia, and also a smaller percentage of permanent cures. Unfortunately, there have been very few reports of any large series of operations for femoral hernia, and still fewer reports of cases traced for any length of time.

The careful analysis of Pott[2] of 933 cases of femoral hernia operated upon prior to 1903, shows that the results of operation for radical cure in femoral hernia have been distinctly inferior to those in inguinal, the percentage of permanent cures in inguinal hernia being 82 per cent. and in femoral 70.5 per cent.

He further shows that the results were much better when the femoral canal was closed than when the sac was simply excised and the wound closed without suture of the canal; the results being 63.3 per cent. of cures without suture, and 76.4 per cent. with suture.

A very large number of methods have been proposed and many of these are still in vogue; however, more by reason of the fact that they were devised by some distinguished surgeon, than by the fact that practical experience has demonstrated their value.

The hope of supplying some of the data necessary for determining the relative merits of different operations for femoral hernia, is excuse for the present paper.

The earlier operations consisted in simple excision of the sac without any attempt to close the canal. In such operations there was usually a recurrence within a year in 30 to 40 per cent. of the cases.

In 1890 Dr. Wm. T. Bull[3] reported thirteen cases of femoral hernia operated upon by this method, eight of which were traced beyond a year, with three relapses. In 1889 and 1890 Cushing and Marcy published a form of purse string suture of the femoral ring and called it a " quilted " suture.

In later methods of operation, in addition to ligating the sac, an attempt was made to close the femoral canal. These methods may be divided into two main groups, *i.e.*:

1. Those in which an effort was made to close the canal by means of a suture applied in a great variety of ways;
2. Those in which it was attempted to close the canal by means of muscle, osteoplastic or heteroplastic flaps.

The suture methods may also be divided in two groups: (*a*) suture of external ring; (*b*) suture of internal ring.

Some of the methods of suturing the canal are exceedingly complicated, *e.g.*, the Lotheissen and the Gordon operations, 1898, and more recently those devised by Roux and Nicoll. The reasons advanced by the authors in favor of adopting these more difficult and complicated procedures for the cure of femoral hernia are all based on the supposition that femoral hernia is not readily curable by simpler methods. With this opinion I strongly desire to take issue.

The first paper of note going far to prove that almost perfect results can be obtained with simpler methods, was that of Bassini,[4] who, in describing his own method for the radical cure of femoral hernia, reported fifty-four cases operated upon by the same, of which forty-one had been traced from one to nine years, without a single relapse.

The technique of Bassini's operation was exceedingly simple and easy of performance, consisting in high ligation of the sac and uniting the roof of the canal with the pectineal fascia and muscle by means of seven interrupted sutures.

A recent paper by De Garmo, reporting 110 operations for femoral hernia by a method similar to Bassini's, with but one relapse, furnishes additional proof of the strongest kind of the value of the simpler methods.

In my own cases, two methods only have been employed:

1. *Bassini's Method,* which was used in fifteen cases, with one relapse, the only variation being the substitution of kangaroo tendon for silk used by Bassini. The case in which a relapse occurred was the only one in which there was suppu-

ration, and to this fact the relapse may be attributed. The relapse consisted, however, only in a slight bulging of the canal, which disappeared after the use of a truss for a short time, and the patient is now well, ten years after operation. It can, therefore, hardly be classed as a true recurrence.

2. *The Purse String Suture Method,* which has been employed in 103 cases. It is based upon an operation devised by Cushing of Boston, in 1888, but differing from it somewhat in technique. The operation may be briefly described as follows:

An oblique incision is made one-quarter to one-half inch below Poupart's ligament and parallel with it, almost identical with the incision made for inguinal hernia, only slightly lower and a little shorter. The sac with the mass of extra-peritoneal fat that almost always surrounds it is then freed well up into the femoral opening. The masses of fat are carefully removed, the sac itself, by gentle traction, is brought down well beyond its neck to a point where it widens into the general peritoneal cavity. It is always opened before ligature, so make sure that it is empty. If omentum is present, this is tied off and removed. The ligature having been placed well beyond the neck by transfixion, it is carefully tied and the sac removed. When the stump of the sac has been pushed through the opening into the abdominal cavity, there is no longer any funicular process present in the femoral region. With a curved Hagedorn needle,[5] threaded with kangaroo tendon of medium size, the suture is placed as follows: The needle is first passed through the inner portion of Poupart's ligament or the roof of the canal, then downward, taking firm hold of the pectineal fascia and muscle, then outwards through the fascia lata overlying the femoral vein, and finally upwards, emerging through the roof of the canal about one-quarter inch distant from the point of entrance (Fig. 1.) On tying this suture, the floor of the canal is brought into apposition with the roof, and the femoral opening is completely obliterated. The skin and superficial fascia are closed by means of an inter-

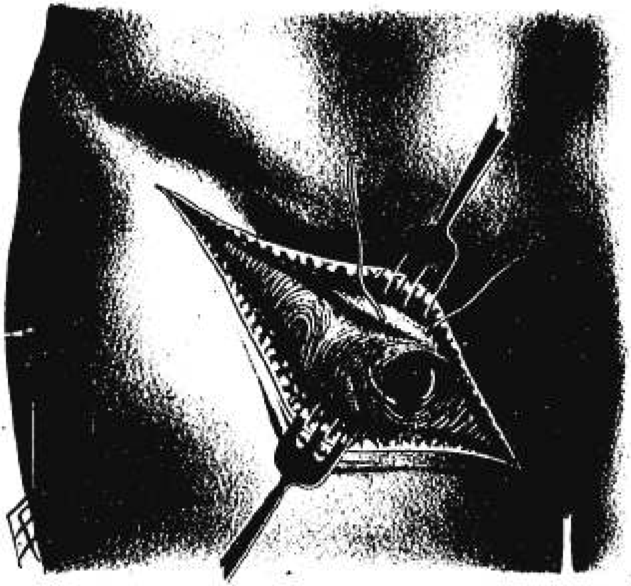


FIG. 1.—Obliteration of the femoral opening by purse-string suture.

rupted catgut suture and a sterile dressing is applied, without drainage. The first change of dressing is made at the end of one week. The patient is kept in bed for two weeks and allowed to go home at the end of two and a half weeks. A firm spica bandage is worn one week after leaving the hospital, at the end of which time no further support is needed.

The purse-string suture thus applied accomplishes exactly the same thing as Bassini's operation for femoral hernia, and it has the advantage that it is much more easily and quickly performed.

In the 100 cases operated upon by this method, most of which have been very carefully traced, there has not been a single relapse.

The final results of the present series of cases as far as traced, are as follows: Well over ten years, 5; well from five to ten years, 17; well from two to five years, 35; well from one to two years, 12; or 57 well upwards of two years; 69 upwards of one year.

As regards the ages of the cases operated upon, my statistics show the following: Under five years, 3; five to ten, 15; ten to twenty, 19; twenty to thirty, 32; thirty to forty, 29; forty to fifty, 11; fifty to sixty, 5; seventy years of age, 1.

These cases have in no way been selected and the method has been employed in the largest hernias with equally good results. There have been no complications, with the exception of a slight phlebitis in one case, which soon disappeared.

Mortality.—In the non-strangulated cases, there has been no mortality, and only one case of suppuration. In the strangulated cases, four in number, there was one death, in a woman, 55 years of age, in whom strangulation had existed for three days and the patient was in a desperate condition, necessitating resection of a large portion of the intestine. In another case, of strangulation, a man 70 years of age, operation was performed in a tenement house in a small town. The patient apparently made a good recovery, but died two to three weeks later of some unknown cause. The physician in charge did not believe that death was in any way connected with the operation, although I do not think it fair to exclude the operation as a possible cause.

In the most recent edition of von Bergmann's Surgery it is stated that " simply closing the external femoral ring would accomplish little more than closing the external inguinal ring. Modern methods attempt to close the entire canal, including the internal ring."

Bacon of New Haven attempts to apply the same line of reasoning to the femoral as to the inguinal canal. He argues that the lesson taught by Bassini in inguinal hernia, that the proper place to start the obliteration of the canal is the internal ring, should apply with the same force to the femoral canal. He states that " the plans for the closure of the femoral canal have, until most recently, been subject to the same insidious defect which invalidated, more or less completely, the older of the so-called modern operations for hernia of the inguinal form, in that however firmly the crural end of the femoral canal has been closed, its abdominal end has not been satisfactorily obliterated, and thus the opportunity has remained for a knuckle of gut or a bit of omentum to insinuate itself along the tract of the old hernia, and so, in a certain proportion of cases, provoke its recurrence."

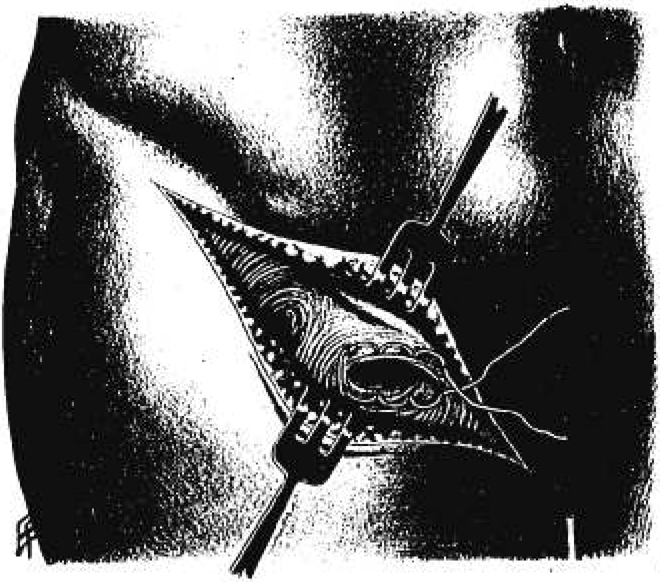
The earlier purse-string methods for closing the femoral canal, first brought out by Cushing and Marcy, 1888–89, while admitting that they are a distinct advance over the previous operations of plugging or invaginating tissues into the femoral opening, Bacon considers inferior to the method of Bassini. However, in the latter, he says, there are two weak points:

1. That the abdominal orifice of the femoral canal is not closed;

2. That " the breach in the belly wall is attacked at the wrong end of the femoral canal; furthermore, that the crural arch itself is closed at a mechanical disadvantage."

Kammerer,[6] in a more recent article on Femoral Hernia,

Fig. 2.



gives expression to a similar criticism, and states that Bassini's method practically only closes the external femoral ring. He further adds: "The same, I think, can be said of the various forms of the purse-string suture which, if anything, only creates greater tension." Kammerer believes that the method of Fabricius, in which an attempt is made to obliterate the opening at the internal ring by dividing the superior cornu and some of the fibres of Poupart's ligament sufficiently to relieve all tension and permit the parts to be sutured to Cooper's ligament, is a distinct improvement over Bassini's operation or the purse-string suture and the Lotheissen and Gordon methods he regards as still better.

The point I would make in discussing these various criticisms of the Bassini and purse-string methods, is that the value of an operation in surgery cannot be settled thus easily, and least of all can it be estimated according to the degree to which it fulfills certain theoretical geometrical or mechanical conditions. There are a great many other factors that enter into the question. Let us take, for example, the McBurney operation for inguinal hernia. Theoretically, it seemed an ideal operation. Yet experience proved it to be of little value, because it failed to take into consideration the fact that scar tissue subjected to pressure or tension has the power of stretching or yielding indefinitely. Many of the more complicated methods for femoral hernia, while they may be theoretically and mechanically correct in principle, depend for their success upon some seemingly minor factor which is given too little consideration, yet which may completely annul their supposed superiority. This is well illustrated by those methods in which the canal is perfectly closed and obliterated by means of metal nails or silver-wire sutures; yet, the very presence of these foreign bodies often brings about secondary sinuses with suppuration, which, in turn, may be the chief cause in producing a relapse.

As to the Gordon method, so strongly advocated by Bacon and Kammerer as well as the other methods of closing the femoral ring from the inner side, necessitating opening the inguinal canal, the possibility of an inguinal hernia resulting from an attempt to cure the femoral, should not be lost sight of. Not a single surgeon has reported more than an insignificant number of cases operated upon by any of these methods and in none of the reports were the cases traced for any length of time.

While we may be willing to grant the truth of the statement of Bacon that " it is far better to follow a mechanically correct paradigm than to practice an operation whose mechanical deficiencies must be supplemented by peculiar skill or extraordinary experience on the part of the operator," yet, it must be conceded that, if the success of the simpler operation of Bassini and the purse-string methods depended upon peculiar skill or extraordinary experience on the part of the operators, how much greater skill and experience would be required to successfully perform an operation like the Gordon method, for the understanding of which Bacon himself has thought it necessary to devote seven pages of description?

The value of an operation for femoral hernia, as the value of all operations in surgery, should, I believe, be estimated not by trying to ascertain how nearly it fulfills certain theoretical considerations, however important they may appear to the individual surgeon, but by finding out to what extent they meet two very practical tests: 1. Simplicity, including safety; 2. Efficiency; that is, permanence of cure.

Of two methods of operation giving equally good results, that method which is the simpler, and more easily performed, should have the preference.

The purse-string method that I have described, I have used in 100 operations without a single relapse. These operations, extending over a period of fifteen years, and including all varieties of femoral hernia, without distinction as to size of the hernia or age of the patient, would seem to show that the method had satisfactorily stood the practical tests that I have laid down. Moreover, it is the simplest in technique and most easily learned of all the various methods with which I am familiar.

In discussing my earlier results, Kammerer[7] states that he does not believe sufficient time had elapsed to warrant definite conclusions as to ultimate results, and quotes the statistics of Heidenthaler to show that the femoral hernia in which the external femoral opening has been sutured, recur very late, on an average after two years.

Heidenthaler's article was published in 1890, and Kammerer himself states that Bassini's article, published in 1894, represents the first systematic attempt to close the femoral canal in addition to ligating the sac. It is true that there were a few earlier cases reported by Marcy, Bull and Cushing, in 1889–90, but these cases were manifestly too few and widely scattered, as well as imperfectly traced, to enable Heidenthaler as early as 1890 to draw any conclusions as to the interval of time between operation and relapse in cases operated upon with closure of the external ring.

At the Hospital for Ruptured and Crippled we have kept very careful records of all cases of relapsed hernia operated upon by various methods and in various clinics during the past sixteen years. An analysis of these cases, already published in previous papers, shows that in 504 relapsed cases, including all varieties of hernia, the relapse occurred during the first six months after operation in 83 per cent. and during the first year in 90 per cent. of the cases.

This experience is confirmed by the findings of Pott, who in a series of 145 collected cases found that recurrence took place within the first six months, in 71.66 per cent., and during the first year in 91 per cent.

In these statistics no attempt was made to separate the femoral from the inguinal relapses, but in view of the point raised by Dr. Kammerer, I have recently made a study of the entire list of femoral cases, with the following result:

Within the past sixteen years, twenty-eight cases of relapse following operation for femoral hernia have been observed at the Hospital for Ruptured and Crippled. Of this number the time of relapse is not definitely stated in three; in eleven it took place within the first six months after operation, in six, between six months and a year; or seventeen relapsed within the first year, being equal to sixty-eight per cent. Five cases (twenty per cent.) relapsed after one year and only three (or twelve per cent.) later than two years after operation.

The method of operation in these cases was not in all instances definitely stated, but in the majority some attempt was made to close the external ring.

These results fail to confirm the opinion expressed by Heidenthaler, that most of the relapses of femoral hernia occur after two years, but show that—as in inguinal hernia—the great majority of relapses are observed within the first year after operation, and only twelve per cent. after two years.

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[1] Deutsche Zeitschr. f. Chir., 1903.

[2] Loc. cit.

[3] Med. Rec., vol. 57.

[4] Arch. f. Klin. Chir., 1894, vol. 47.

[5] In my earlier cases I used a special needle, somewhat resembling an aneurism needle, for the introduction of the purse-string suture, but soon gave it up for the Hagedorn needle which, with a little care, may be used with perfect safety and much greater facility. I now use a needle holder.

[6] ANNALS OF SURGERY, 1904, vol. 39.

[7] Loc. cit.

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